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WILDER'S PLANING MACHINE.

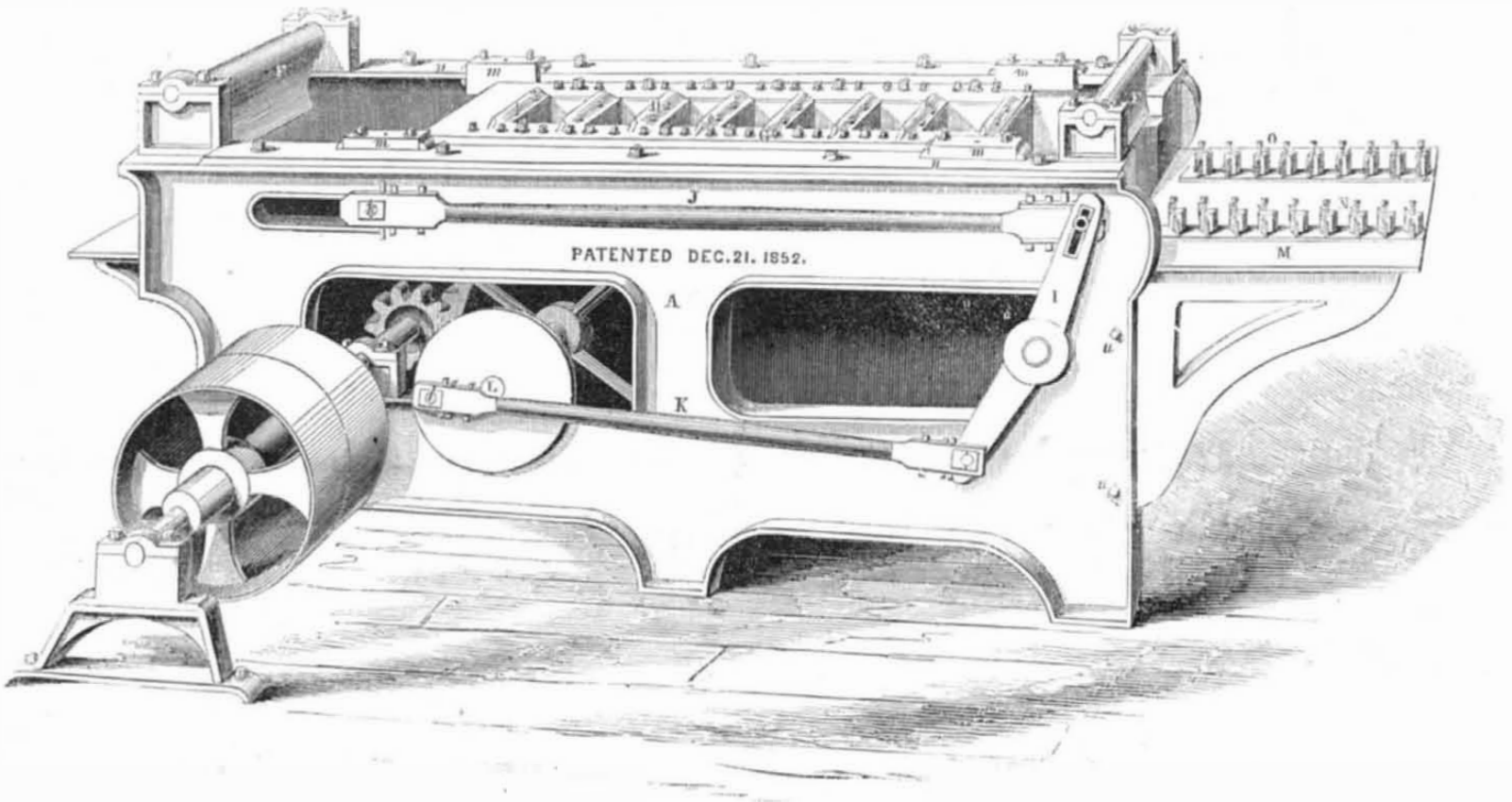
The annexed engravings are views of an improvement in machines for planing and tongueing and grooving boards and planks, by Aretus A. Wilder, of Detroit, Mich.

Figure 1 is a perspective view, and figure 2 is a central longitudinal section. The same letters of reference indicate like parts.

The nature of the improvement consists in constructing planing machines so that the board to be planed can be clamped to the reciprocating bed, whilst being fed by the backward motion of the planes, so that the board will be free to move over the stationary bed plate upon which it is planed.

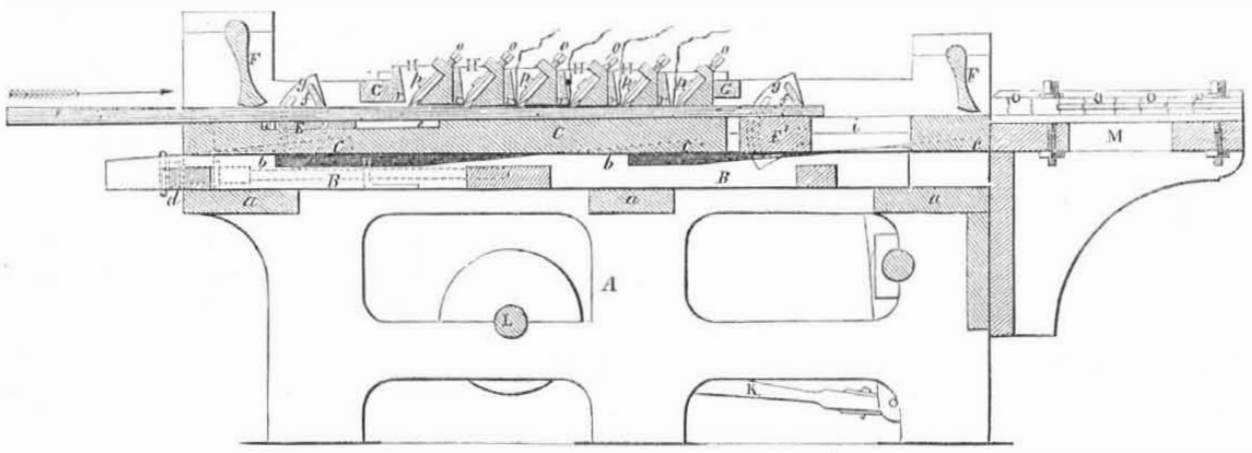
A is a frame of suitable size and form, having cross bearings, *a*. Resting on these is a sliding frame, B, with incline planes, *b*, on its upper side, corresponding with and fitting against inverted inclines, *c*, on the underside of the main bed, C. This frame is movable longitudinally, by means of the screw, *d*, for the purpose of elevating and depressing the main bed to adjust it to the various thicknesses of lumber to be planed, which is effected by the inclined planes on the frame, passing under in opposition to those in the underside of the bed, which ensures a solid bearing to said bed, and is essential in finishing the lumber of equal thickness. This bed has no lateral or longitudinal motion; the face of it is formed with a recess, *e*, near to each end across it, in which slide the reciprocating sectional beds, E E′, the faces of which are slightly raised

Figure 1.



above the level of the main bed, to prevent the lumber from bearing too hard on the main bed, whilst being fed into the machine. The reciprocating beds are connected with each other by side rods, and have attached to them dogs, *f*, which are hung in segmental brackets, *g*, at each end of said beds, whereby they can be adjusted to suit the thicknesses of the lumber; the use of these beds and dogs is to draw the lumber into the machine and feed it into the side cutters by their backward motion. In returning they pass freely under and over it, whilst it is held fast by the dogs, F, which clamp the board between them and the main bed to prevent it from receding, whilst under the action of the surfacing planes. The centre part of the bed E′, sinks through an opening in the main bed; the undersides of each are on the same level, leaving sufficient metal in each side of main bed to form slides for the bed E′, to slide on and allow of recesses across its face in the direction of its motion which admit of a series of bars, *i*, on a level with the main bed, to give the lumber a solid bearing under the last knife. The frame, G, which carries a series of knife stocks, H, bolted to it, transverse to and above the bed, is supported by bearings, *m m*, on slide, *n*, on either side of the frame, A, and on which it travels, having a reciprocating motion imparted through the rock shaft arms, I, which are connected with the wrist pins, *k*, by the rods, J, at either side of the frame; the rods, K, connecting the downward arms of the rock shaft with crank pins, *l*, on either end of shaft, L, which is driven by any suitable driving gear. To frame, G, are attached the sliding beds by rods, imparting a like reciprocating motion to them. The knife stocks H, are graduated on their under side, each one rearwards, a little lower than that in advance of it; the face of each in its cross section, is parallel with the bed, and has its permanent mouth piece, *r*, cut away on the underside to the level of the heel of the knife stock in advance of it: the heel of the knife stock and its mouthpiece take equal bearing on the board; *o* are set screws to adjust the knives, they are secured to the stock by bolts, *p*, so that their edges are exactly even with the heel, of the knife stock; the difference between the level of the mouth piece and that of the heel of the stock, will be the thickness of the shaving which each plane will take off, which is gradually reduced by each knife stock until the last knife takes the thinnest possible shaving, and puts a fine finish on the lumber; M is a table at the rear end of the machine; it is formed with brackets bolted to the main frame with bolts, *u*, fitting in slots so as to adjust its level to suit that of the main series of grooving and tonguing planes, O O and N. The bolts which secure these are fitted in slots so as to adjust them for boards of different widths. These matching planes are placed like the surfacing planes, each one rearwards placed deeper than the one in the front.

Figure 2.



In operating the machine, the lumber is fed in as indicated by the arrow, and is caught by the dog on the reciprocating bed, and pulled in by its backward motion, on the return motion of which the board is held fast by the stationary dog, F, whilst the planes pass over it to the extent of their stroke, when it is again pulled in by the backward motion as before, and so on alternately; and when it has passed the surfacing planes, is fed into or between the siding planes, by the back action of the reciprocating beds and dogs, whereas the surfacing is performed during their forward motion, thus equalizing as far as possible, the amount of work performed throughout the entire revolution of the driving shaft.

The claim is for "the reciprocating beds arranged with respect to the stationary bed in combination with the clamps attached to the plane stock, whereby the board is clamped between them, and is free to move over the stationary planing bed, and fed during the backward stroke." More information may be obtained by letter addressed to the inventor.

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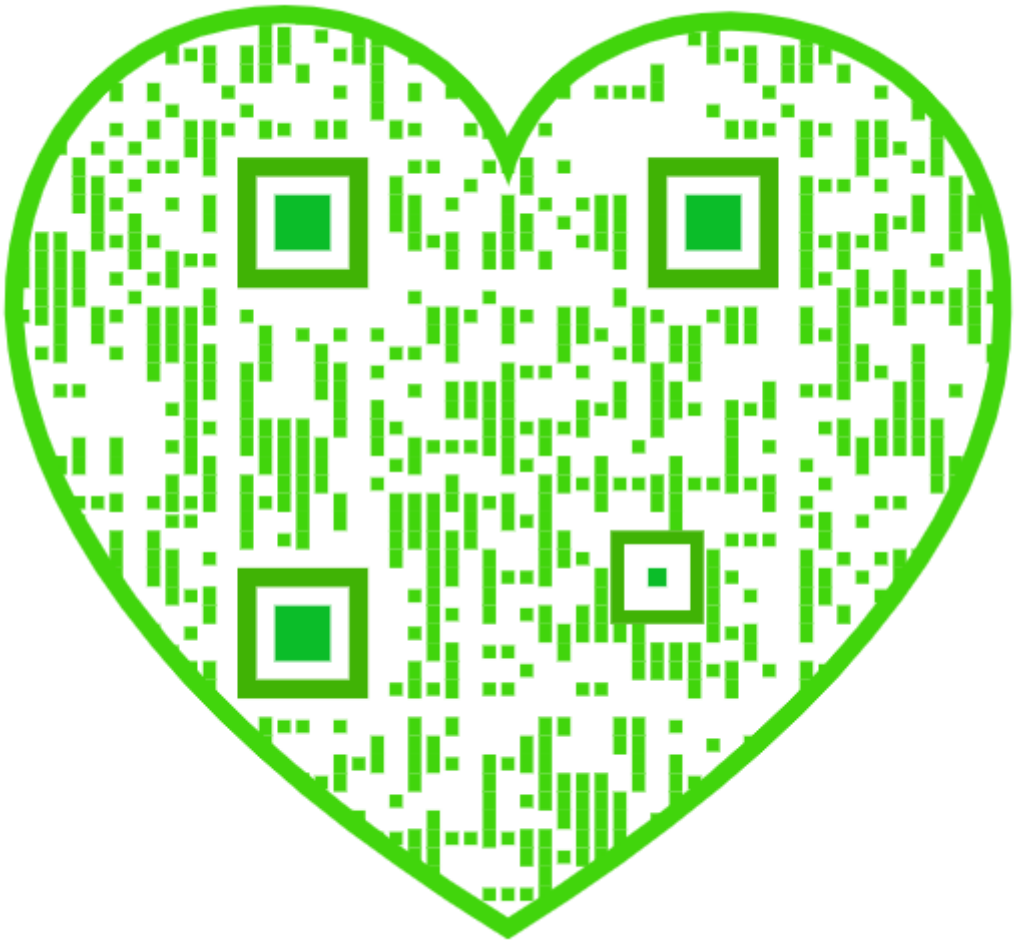

MISCELLANEOUS.

Food and Digestion.

The aliments or nutritious principles of food are divided into two great classes: the one is distinguished by the absence of the element nitrogen, and is termed non-nitrogenized; the other containing that element, and called nitrogenized aliments. The first or non-nitrogenized, contain the elements carbon, hydrogen, and oxygen, and are divided into three groups, depending upon the relative proportion of these elements. Sugar and starch are distinguished by possessing an identical proportion of carbon, and by having an equal number of hydrogen and oxygen atoms, these elements being in the exact proportion to form water. Starch consists of 12 atoms of carbon or charcoal, and 10 of water. Vegetable acids—those substances which impart sourness to fruits—contain variable proportions of carbon, a very small amount of hydrogen, and an excess of oxygen. Fats and oils are found to be composed almost entirely of carbon and hydrogen, with but a very small amount of oxygen. Albumen, fibrine, caseine, whether derived from the animal or vegetable world, are identical in composition. Thus we have vegetable and animal albumen, vegetable and animal fibrine, and vegetable and animal caseine, accordingly as they are obtained from either animals or plants. None of these substances will sustain life alone; this has been often proved. They must be mingled together. Man requires a mixed diet, but how shall it be mixed. Here, fortunately, nature comes to our aid—she has prepared a recipe. We find it in the composition of milk, the true type of all diet. Here the alimentary ingredients are so judiciously mingled, as to furnish the elements for forming the entire human body. The true philosophy of dietetics is to be found in a milk pail. Heat, the agent used in cooking, is very powerful to alter and destroy all organized compounds. It is variously applied, as in boiling, roasting, frying, and with different results, both in kind and degree. Many of these changes are not yet well understood—they have not been sufficiently studied. Of all the alimentary principles, albumen is the most promptly altered by heat. It exists in vegetables and also in animals—in their blood, and also diffused throughout the flesh in a liquid form, in which it dissolves in water. A small amount of heat converts it into a hard, brittle solid, insoluble in water, forming coagulated albumen, as in the boiled white of eggs. If, therefore, a piece of fresh meat is placed in cold water, the albumen tends to dissolve out—it is withdrawn from the flesh. If the meat is put in boiling water, the albumen, on the contrary, coagulates all over the surface, forming a crust which cuts off the solvent action of the water.

To retain the albuminous juices in substances to be boiled, they should be added to the boiling water; if, on the contrary, we wish to extract these juices, as in making soup, an opposite proceeding is admissible—we add the solids to cold water and gradually raise the temperature. Prof. Leibig says, that in salting meat, the brine which is formed contains a large proportion of the most nutritious juices of the flesh. By salting, therefore, the normal composition of meat is essentially altered. The necessity of food arises from the waste and wear of all parts of the system. As the body is used its atoms die and are carried away. As the dead atoms perish, new ones must be constantly supplied of different kinds, as the various parts of the body may require. The body, therefore, analyses the food that is taken into it. It separates it into its elements, withdrawing one part here and another there, as it needs them for different purposes and in different places. But before these constituents of food can be separated, it must first be dissolved, just as a chemist must first dissolve a mineral before he can separate its elements or analyze it. This solution of food is called digestion. It begins mechanically in the mouth by mastication, just as the chemist first crushes his mineral with pestle and mortar. It is then carried into the stomach, which pours from its wells a liquid known as gastric juice, with which it is mingled by a peculiar agitating motion of that organ. The active principles of the gastric juice are acids, chiefly muriatic with perhaps lactic and phosphoric, and a peculiar organic principle termed pepsin. It is always distinctly acid: this liquid attacks and dissolves the nitrogenized alimentary principles, the other class remains unchanged and untouched in the stomach. Stomach digestion by no means completes the process. It dissolves only albuminous substances, a portion of which is immediately absorbed by the veins of the stomach and carried at once into the circulating system. The residue of the food now passes forward into the first portion of the intestine called the duodenum. Into the duodenum there is poured from the liver a liquid called bile, and from the pancreas another liquid called pancreatic juice, both alkaline from the presence of soda in considerable quantities. These alkaline juices now seize upon the undissolved alimentary compounds, starch, sugar and the oily bodies, dissolve and transform them, thus completing the act of digestion. It is but recently that Bernard of France has demonstrated that the office of the pancreatic juice is to dissolve the fatty substances, and for this demonstration he lately received the prize of the Paris Academy of Sciences. The dissolved portions of the food which are to become blood are now taken up from the intestine by innumerable little vessels termed lacteals, which carry forward their contents and deliver them into a large vein in which they are swept along into the great current of the circulation. It may be regarded as a physiological fact, settled beyond reasonable doubt, that the destination of the non-nitrogenized alimentary principles is to be burned throughout the body by oxygen introduced in respiration for the maintenance of animal temperature. These substances evidently cannot be converted into the tissue of the fabric, for they do not contain the materials to form that tissue. They are of various degrees of combustility, giving rise to unequal amounts of heat by burning, and are therefore adapted to different climatic and seasonal conditions of temperature. In the colder regions, foods rich in hydrogen and carbon are instinctively sought. In the warmer climates, the less combustible starches and vegetable acids are prized. On the other hand, nitrogenized elements minister to the true nourishing process—they are transformed into muscle and tissue; they build up the fabric. All these organized substances are designed to be decomposed in the production and evolution of power. Now, if there be a limit to the power of vegetable construction upon a given area of land, there is also a limit to the number of animals that can live upon that area. The agricultural or grain-consuming races are by far the most powerful and are rapidly driving the hunting or flesh-eating races from the face of the earth.

Vancouver's Island.

A return made by the Hudson's Bay Company to the British House of Commons, communicates some interesting particulars respecting Vancouver's Island. One thousand four hundred and seventy-eight acres of land have been sold to eleven persons; the fur trade of the Company were in possession of 3,084 acres, part of which they have sold to their retired servants. The Puget Sound Company have provided four farms to employ emigrants on their first arrival. The Hudson's Bay and Puget's Sound Companies have, at their own expense, sent out 271 males, 80 women and 84 children, since 1848. These emigrants were mostly agricultural laborers under engagement. One thousand, three hundred and fifteen tons of coal have been collected by the Indians, from the surface seams, and had been exported by the Company. The Company had incurred considerable expense in boring for coal without success, until lately, when promising appearances had been discovered about eighty miles north of Fort Victoria, on the east coast of the Island, nearly opposite the mouth of Fraser's river. Measures had been taken to follow out the search and work the coal if found practicable. The high rates of wages in Oregon and California had tended to the detriment of the Island. Flour had still to be imported for the use of the settlers.

Improved Pump.

John A. Burnap, of Albany, N. Y., has taken measures to secure a patent for an improved double suction and force-acting pump. The improvement consists in employing two pistons within one cylinder, each united to a separate rod, which are made to rise and descend alternately so that a continuous flow of water is obtained, each piston performing the two operations of suction and force at the same time. The upper parts of the piston rods terminate in racks, between which a cog wheel is placed, having an alternate movement imparted to it by a lever attached to its axis and which causes the pistons, as abovementioned, to rise and descend alternately thus serving the purpose of a pump with two separate cylinders. The other improvement consists in the peculiar arrangement of the air chamber, which is formed by encircling the pump cylinder in whole or in part by another hollow cylinder, the communication between the two being made by a passage leading through the top of the latter.

Groove Cutting Machine.

Measures to secure a patent for the above have been taken by James Campbell, of Macon, Ga. Carpenters and cabinet-makers will appreciate the advantages of this machine, which performs its work with great rapidity and correctness. It is intended to cut cross and other grooves in wood by employing an S-shaped cutter in combination with two circular saws, these three tools being fixed on a horizontal revolving mandrel, which can be adjusted to suit whatever depth it may be requisite to cut the groove. The saws make the incisions and the cutter completes the recess by removing the wood, and makes the groove square, perfectly smooth and true. The operation of grooving at different angles and widths is facilitated by indices marked on the sliding carriage, which moves transversely, and therefore feeds the stuff in that direction, but is susceptible of alterations for feeding at any angle.

New Paper Cutter.

Measures to secure a patent for the above have been taken by Frederick Hesse, of Bethlehem, Pa. This invention greatly facilitates the manipulations of the artisan who works on such fabrics as paper paste broad, and other like materials. To a platform is secured by set screws an adjustable bed, on which works a sliding stock, whose motion is facilitated by small rollers. The knife or cutter is attached to a vertical rack which is raised or lowered by a pinion, this latter together with the rack and knife being carried by the sliding stock and so placed on it that the handles which are grasped to move the stock on being turned, cause the ascent or descent of the knife. There is, moreover, a gauge that can be set either parallel or obliquely to the bed.

Market Gardening in England.

Within a radius of fifteen miles from London, there are two hundred thousand acres of land in the hands of market gardeners, all laboring for the London market. Ten thousand loads of turnips, 100,000 sacks of peas, 20,000,000 heads of celery, 40,000,000 cabbages, and 1,000 tons of water-cresses are said to be sold annually in Covent Garden market alone, to say nothing of the potatoes, carrots, beets, onions, herbs of all kinds, &c., which are sold in immense quantities.

Maple Sugar.

At a late meeting of the Farmers' Club, in this city, an article was read on the subject of maple sugar and of its great importance as one of the products of our country. By the late census it appears that the production of maple sugar in this country in 1850 was within a small fraction of thirty-four millions of pounds. An orchard of maple trees has been found almost equal, acre for acre, with the sugar cane in producing sugar and molasses.

The frequent use of asparagus is strongly recommended in affections of the chest and lungs.

It is stated that the Director of the Mint has purchased about half a million dollars in silver, at a premium of four or five per cent. to melt down for the new silver coins.

White Curd Soap.

This is made of tallow only, in the proportion of 16 cwt. of tallow to 200 gallons of ley, which is boiled with a moderate fire for about two hours, and the fire being withdrawn, is left to settle for another two hours, and then the ley pumped off. As the ley separates quickly from curd soap, two or three boils a day may be given with care, until the soap appears something like a curdy mass, and when pressed between the finger and thumb forms a thin, hard, clear scale, not sticking to the finger. Then withdraw the fire, add a few pails of cold ley, and when settled pump the ley clean off. The soap is purified by melting it over again with a fresh supply of water repeating the process until it has not the slightest blue cast. The moulds for white curd soap should be lined with coarse cloth, and covered with matting, after the soap has been put into the moulds, and well stirred, in order that it may cool slowly and uniformly. A cwt. of tallow is computed to make 3 cwt. of white curd soap, but it is seldom that so much can be obtained. The ley is usually made of 3 cwt. of potash with 3 cwt. of soda, but kelp is sometimes used, and as it contains much sulphuretted hydrogen and other impurities, the water pumped off will be of a dark bottle-green color.

White curd soap, scented by adding some oil of caraway seeds, just before it is poured into the moulds, makes Windsor soap.

Railroad to the Pacific.

Col. Benton has published his plan for a railroad to the Pacific. He advocates the Central route, for which Colonel Fremont has long expressed a preference. He is in favor of making this highway on a grand scale, reserving a tract a mile wide for all sorts of roads, rail and macadamized, and two margins one hundred feet wide for independent and rival telegraphic lines. He is opposed to making this highway by any mixture of public and private means, or by giving lands to companies, but holds that the United States should build the road and the fixtures, and let out the use of it for terms of seven or ten years to the lowest bidder. The present system of railways from the Mississippi to the Atlantic, he regards as an expanded fan. the spokes of which converge to St. Louis, the handle extending thence to San Francisco.

Grass and Hay for Cattle.

A correspondent inquires of us, "why it is that cattle thrive and get fat much faster on grass than they do on hay, and what it is that grass loses by becoming hay?" Chemical analysis never can give the answer. One kind of food may contain far more of the constituents of beef than another, and yet not be suitable for food. Cattle have their likes and dislikes of food, as well as human beings, and no animal will thrive on food that does not please the taste, however nutritive it may be, because it will not eat so much of it. The sweet juice of the grass, which is absent from the hay, makes it palatable, and affords the requisite amount of moisture to make it digest most easily.

The piers for the railroad bridge across the Great Pedee river, on the Wilmington and Manchester Railroad are composed of large hollow cylinders of cast iron, nineteen feet in circumference, their bases are sunk many feet into the bed of the river by exhausting the air from within them, by the method known as the pneumatic process, for forming foundations. The cylinders are filled with concrete and thus form piles of great strength and permanency.

A company is being organized at Cincinnati, Ohio, to pave the turnpike from the head of Western avenue, at Brighton, to Commonsville, Spring Grove, and Carthage, with iron plates. The sides of the road will be filled in with dirt, and ornamented with shade trees.

A law has recently gone into effect in Maine rendering pedlars and other persons who shall sell goods, wares, or merchandise, by sample or otherwise, within that State, liable to a fine of not less than fifty or more than two hundred dollars, unless they have been for five years residents of the State.

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[For the Scientific American.]

Weights and Measures.

As you are advocates of reform in everything susceptible of reform, I wish to present a few remarks in advocacy of reform in weights and measures. It seems to me to be entirely unnecessary to have three or four different kinds of weights. I have found, by many years' experience in teaching, that it is very perplexing to students, and unnecessarily retards their progress, in having to learn so many tables, and still more perplexing to go through the exercises under these tables.—But as I would not object to anything without offering a substitute, I propose the following:—

Let Apothecaries and Troy weight be abolished, and let us have such divisions of the lower denominations of Avoirdupois weight as may be necessary to express the smallest quantities desired. And where is the necessity for so many kinds of measure? If all our measures of capacity have the same unit, why not have the same number of units for the same denomination in all the tables? Let us have but one measure for all solids and liquids, and let our present standard of dry measure be made that standard. Our tables of long, square, and solid measure, I would not have altered. There is a vast deal of ignorance among the people on this subject, particularly in reference to measures. Many do not seem to know that Congress alone has power to establish weights and measures; and hence we hear of Tennessee measure, Alabama measure, &c. Such a State gives 32 quarts to the bushel, and another gives 40 quarts, &c. Now if a cubic inch is the measuring unit, and the law requires a bushel to contain 2150·4 of these units, the value of a bushel will not be changed by dividing it into 32 parts, or into 32,000 parts; for the sum of the parts is equal to the whole. But it a quart is one thirty-second part of 2150·4 inches=67·2 inches, then no community has a right to set up a standard that requires 40 quarts, or any other number of quarts to the bushel, inasmuch as it would be an open violation of the constitution, Art 1, Sec. 8, Sub. Sec. 5.

B. W. White.

Bear Spring Seminary, Giles Co., Tenn.

Steam, Oil, and Milk for Wool.

I noticed in your valuable paper of March 12th, under the head of Events of the Week, "Milk for Lubricating Wool in England." I would as soon attempt an improvement upon the old stage coach to compete with the railroad cars as to think of using milk, or even oil of any kind, upon wool, which is a very great detriment to the process of manufacturing and requires an additional expense to be cleansed out again to the injury of the staple of the wool and the color. We introduced George L. Mason's Patent Steam Carding and Spinning in Sept. 1849, and have not used any oil or milk or any substance to lubricate our wool since except steam. The expense of steam for this purpose is about one dollar per day. Our bills for oil and cleansing soap were more than five thousand dollars per year. The cost of introducing the steam including the patent is about $150 per set of cards, this expense is more than saved in four months' time.

We have used, since introducing the steam, more than seven thousand pounds of wool. Some of the benefits resulting from steam carding and spinning not named above, are more perfect carding and spinning, which produces a much finer and more even yarn, so much so, that we reduced our price of weaving two cents per yard, which amounts to ten dollars per day, and our weavers make more wages than formerly. The average of our yarns is about two runs per pound finer than with oil.

One important item is the removal of all risk of spontaneous combustion from a woolen mill.

Finally, all the benefits resulting from steam carding and spinning combined, are worthy of the consideration of woolen manufacturers in these perilous times of high prices for wool and low prices for goods.

C. W. Cooke, Supt.

Waterloo, N. Y., March 19, 1853.

An "Ornamental Tree Society" has been formed in Stoneham, Mass.

Has the Moon an Atmosphere.

It has for some time been considered a settled question among philosophers, that the moon has no atmosphere—the celebrated "Moon Story" of Richard M. Locke, to the contrary, notwithstanding. The fact relied upon to prove that the moon has no atmosphere is, that upon the occultation of a star by the intervention of the moon, there is no refraction of light, which there would be if it passed through an atmosphere; and further, that no clouds or anything like vapor has been discovered about the moon, nor anything indicating the existence of either animal or vegetable life.

Of late, however, an astronomer at Rome, M. Decuppis has devoted himself much to selenography, and has arrived at the conclusion deduced from a great number of observations that the moon has an atmosphere, though on a very moderate scale, it being only about a quarter of a mile in height, two hundred times less, probably, than the height of the earth's atmosphere, and ot only the thirtieth part of its density; and further, that there are mountains which rise six or seven miles above the atmosphere, and when the star disappears behind them, there is no refraction; but if it disappears behind a valley or plain over which there is an atmosphere, then some refraction, though very slight, is perceptible, and of course there is an atmosphere.

There are those who believe that the shallow atmosphere ot M. Decuppis, may be one like that belonging to our planet in the course of formation. Many geologists entertain the opinion that there was a time when the atmosphere of this earth was chiefly composed of carbonic acid gas, and that races of animals lived in it, they having organs specially adapted for living in the same.

The valleys of the moon may be filled with carbonic or sulphurous acid gas, as they are exceedingly deep, and the regions volcanic. If the *nebular* hypothesis is correct, the moon should have an atmosphere like that of our earth in proportion to its magnitude, consequently no one who believes in that hypothesis can consistently say a word about the probability of a new atmosphere now forming in the moon. If any person studies the question of the "Earth's Atmosphere," its peculiar nature, such as the gases ot which it is formed, their quality, weight, and mixture, and takes into consideration the law ot gaseous absorption, and its relation and adaptibility to man, he cannot but be convinced that it was made by the special act of a Great, Intelligent Being.

Singular Cause of Fire.

The "Boston Atlas" says the following fact may be useful, not only in guarding against a similar occurrence, but in suggesting one among many causes of fire, which are, undoubtedly, often wrongly attributed to incendiarism:—A few days since, a gentleman in the vicinity ot Boston observed that the tassel to the shade of his chamber window was badly burned, and in a manner which gave no indication of the cause. He failed in his inquiries, and no person in the house could give him any information. A morning or two after, the domestic who was attending to the room, ran down in haste, exclaiming that the chamber window was on fire. An examination explained the mystery. In front of the window which looked easterly, stood a shaving glass affixed to a movable stand. A magnifying glass on the back reflected the rays of the sun, bringing them to a focus on the window, and whenever they struck on wood they burned into it, charring the frame in many places. A piece of paper placed against the window was set on fire, and, indeed, the heat was so intense that it instantly burned whatever it touched. When first discovered the frame of the window was blazing. Had the fire extended, it is not probable that the origin of it would have been discovered, and it would have been placed among those incomprehensible causes which can find no other solution than wilful mischief.

A planter near Franklin, La., has gathered this season eleven hundred and seventy-seven bushels of sweet potatoes from three acres ot land—and left behind, he says, enough to fatten about forty hogs.

Steam Navigation with India.

Charles Huffnagle, Esq., American Consul at Calcutta, India, has written a letter to the "National Intelligencer," calling his countrymen to establish a line of steamers between California and Calcutta. He says:—

"The Peninsular and Oriental Company of London now carry mails and passengers from Bengal and China via the Red Sea, leaving Calcutta on the 8th of every month for Suez. Their large and commodious steamers are always crowded with passengers, and the fare to Suez, at the head of the Red Sea, a voyage of twenty days, amounts to nearly five hundred dollars. There is no opposition whatever on this section of the route. The same company have a line between Calcutta and Hong Kong, in China. From Hong Kong, across the Pacific towards our own shores, over a placid and resistless ocean, there is as yet no means of travelling, save by sailing vessels forced to leave the calm latitudes in search of favorable winds.

When the ship canal shall have been constructed through the isthmus, uniting the two great oceans, the wealth of the East must pass along our shores; but long before this desirable undertaking can be accomplished much of vast importance might be done, if, in the absence of private enterprise, unemployed Government steamers were commissioned to carry mails and passengers from Hong Kong, in China, to Panama, or some port within the territory ot the United States, from which passengers could securely and comfortably be conveyed through the United States to Europe. This would be the opening of that great road for the world's commerce and traffic, and I venture to declare that hundreds from India would avail themselves of the opportunity, when once the route had been successfully explored."

Railroads in Canada.

The "Montreal Herald" publishes a railroad table, of which it says:—By this table it will be seen that of 2,051 miles of road, we have already in operation 225 (for the Rawdon and Industry line, of 20 miles, is completed) miles, 608 miles under construction, and 1,211 miles for which charters have been obtained. Of these last, however, 523 miles—the Main Trunk, from Trois Pistoles to Quebec, and from Montreal to Hamilton—are now contracted for, and their construction may be considered secured—leaving 688 miles of chartered road not yet contracted for. Of the 225 miles of completed road, 192 miles are in Lower, and 27 in Upper Canada. Of the 1,131 miles, under construction and contracted for, about 330 will be found to be in Lower Canada, and 800 in Upper; and of 688 miles of chartered roads not yet contracted for, with the exception, say, of 60 miles of the Ottawa and St. Lawrence Grand Junction Road, the whole are in the upper section of the Province. Thus when all the roads under construction contracted for and chartered, are completed, Upper Canada will possess 1,465, and lower Canada only 586 miles of road.

Plan to Supply Brooklyn with Water.

A communication from J. J. Murdock, has been submitted to the Common Council, suggesting a new plan by which the city can be supplied with water. He says that the southern slope of the island rests upon a clean bed of sand and coarse gravel, which is filled with pure and fresh water, and he proposes to excavate a large basin, into which a sufficient quantity of water will collect, to supply 50 gallons for each of 500,000 inhabitants.—The basin to be of such extent of periphery, that the water flowing into it will not bring with it the sand, and of such depth that the sand shall not be forced up from the bottom. From near the centre of this reservoir—which is to be at a distance of five miles from the city boundary—he proposes to take the water at or near the surface through iron pipes, and conduct it to a pump placed at a suitable distance from the basin by which it would be forced into a stand pipe about 2,000 feet above tide-water, and thence be conducted through mains to a distributing reservoir on Prospect Hill. From this point its distribution would be the same as the one now proposed. The communication was referred to the Water Committee.

Sketches of American Society.

By Francis and Theresa Pulszky; 2 vols. 12mo.: price $2. Redfield, 110 and 112 Nassau street, New York.—These two volumes are an account of the tour made by Kossuth and suite through the United States during the past year, and contain the opinions and sentiments of the authors upon the state of society in America. Little mention is made of the ex-Governor of Hungary, the volumes being intended to convey the impressions that their visit inspired in the writers, who are well known as the companions of Kossuth during his sojourn in the United States. It is a clever lively work, but contains nothing of a very striking character, being on a par with the ordinary written travels, and as a great portion is a transcript from the diary of Mrs. Pulsky, which must have been written during the hurry and excitement of their travelling and triumphant processions, there are several inaccuracies that would not perhaps have been made on a careful reflection. In the account of their first reception, on Staten Island, the travellers appear to have been rather annoyed than gratified at the noise and hubbub that they occasioned, nor do we wonder at it, for it really was a most uncouth way of exercising hospitality which was manifested by our neighbors on Staten Island—dragging a sick man, after a long voyage, before he had time to recruit himself, over every part of "their lovely but exposed Island," as Kossuth was pleased to designate it.

Pulszky at times indulges in a satirical vein and quizzes the habit of Congressmen in sending their speeches before hand to the newspaper,—he forgot to add that Kossuth is also guilty of the same misdemeanor, and that his speech at the dinner given by the New York Bar, was set up long before it was uttered.

The subject of slavery is discussed and treated upon; and here we would correct an error of the authors:—in their account of the various deputations that called upon Kossuth at the Irving House, it is stated that one of colored people was received in the drawing-room,—such was not the case: Mr. Howard, the late landlord of that hotel, conducted the deputation to an apartment adjoining the dining room, and it was in this room that the deputation was received, as well as all the others that were presented on the same day, Kossuth leaving the drawing-room for that purpose.

The account of their journey is relieved in various parts of the work with historical sketches of the early history of America,—Pulszky siding with the now-favored opinion that America had been discovered long before the times of Columbus, by voyagers from the north of Europe. He is evidently a well-informed man, and has taken some trouble to inquire into the history and former condition of America, when the Indian ruled supreme the lord of creation. We have no doubt, from their work, that both Mr. and Mrs. Pulszky are agreeable travelling companions, for they appear to have taken the rough and the smooth with the same equanimity. We are also glad to find that a sojourn with us has made quite a Republican of the former, for Pulszky, almost with indignation, disclaims the title of Count, with which he was generally honored by the English and American papers, and which we do not remember him previously to have denied. It is, we suppose, a sign of the times when, in Europe, nobility is at a discount: in his next attempt, Kossuth will depend, we hope, upon the people alone.

Iowa Coal.

The editor of the "Dubuque Daily Herald" has received specimens of coal of a superior description from the coal mines in Des Moines Valley, near Fort Des Moines. It exists abundantly in the vicinity of the town of that name, and is easy of access. A letter from a committee appointed at a public meeting says that the Des Moines river flows over a smooth bed of coal, the depth of which is as yet unknown while the upper stratum may be seen protruding from the sides of the hills in almost every direction.

The Canals of this State will be open for navigation about the 15th of April. The Ohio Canals will be open between the 24th of March and the 1st of April.

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NEW INVENTIONS.

Improved Car Ventilator.

An apparatus that serves the purposes both of ventilating the inside of Railway Cars and also of excluding the dust, has been invented by Samuel Sweet, of New York City, who has taken measures to secure a patent. The invention consists in placing pipes of a gradually tapering form along the side edges of the outside roof of the car, which run from end to end, and are furnished with self-acting shutters that open or close, according to the direction in which the car is moving. The shutters of one end being closed while those of the other are open, and vice versa. The object of this is to prevent the air from passing out when it has been once drawn in, as it is intended for ventilating the inside, and for this latter purpose branch pipes fit into the main pipes, by which tho air is conveyed into a water chamber, where it is purified of the dust and other extraneous matters that have been drawn in with it. This water chamber is divided into compartments and furnished with deflectors, which, from their shape, give a downward tendency to the current of air, dust, &c., so that the air, by being drawn down into the water, is purified and rises in a proper state for ventilation. This object is effected by an elliptic or oval-shaped pipe in the centre of the ceiling, which has its side edges open or perforated, so that the air may escape in equal jets into the cars. The peculiar shape of the distributing pipe and the concave form of the ceiling against which it lies, causing the air to pass along the side of the latter towards the windows of the car, and thereby preventing the entrance of the dust.

Hot-Air Furnace.

Measures to secure a patent for the above have been taken by Elisha K. Root, of Hartford, Conn. The nature of this invention consists in the peculiar construction and arrangement of the cold air passage and flue of the furnace, whereby the cold air is made to pass over a great area of heated surface and a large volume of heated air is obtained with a small quantity of fuel. For this purpose the cold air passage is so arranged that the air is heated by passing around the smoke-pipe, as well as by being brought into close proximity with the hot air flue, and is afterwards brought into contact with a dome which is placed over the fire-chamber and communicates with the hot air flue. It has now become completely heated, and is conveyed through the proper tubes or pipes to those apartments or portions of the building designed to be heated. The other improvements consist in the arrangement of the ash-pit and in an inclined passage leading upward to the fire-chamber for supplying it with fuel, the object being to prevent, by this contrivance, any escape of gas from the fire-chamber otherwise than by the hot-air flue.

Super-Heating Steam in Locomotives.

The annexed engravings represent a section and top view of the invention of Messrs. Hypolite Uhry, and Henry A. Luttgens, both of Patterson, N. J., for overheating steam within the smoke box of locomotive engines for the purpose of improving the working of steam in cylinders with outside connection.

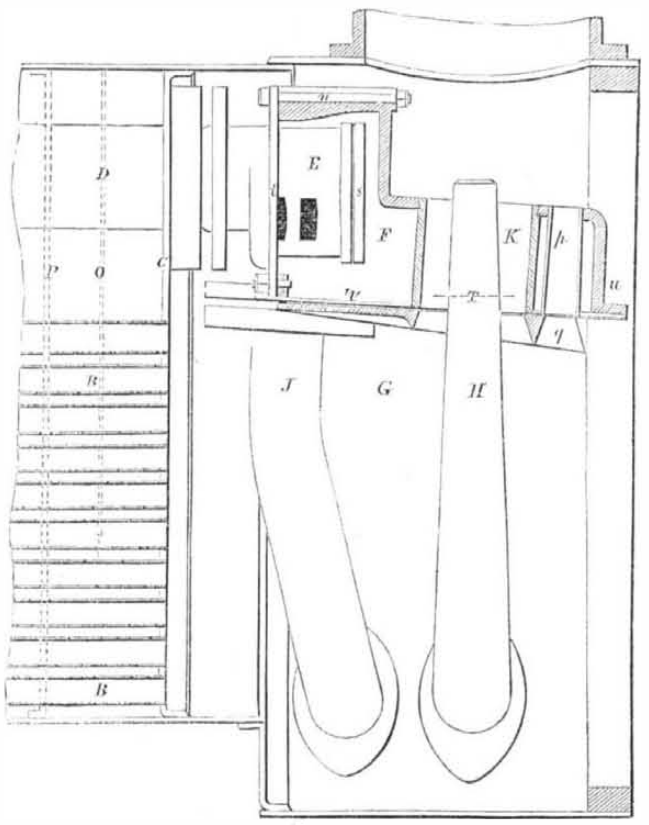
It is well understood in practice that condensation of steam within cylinders of locomotives is a great disadvantage, not only in reducing the effective pressure upon the steam side of the piston, but also in creating a formidable back pressure upon the exhaust side by the obstruction which is, by small particles of water, imposed upon the efflux of steam through the exhaust cavities.

In Daniel Kinnear Clarks' "Treatise on the Mechanical Engineering of Railways," the author, discussing the first part of the question, "the difference of pressure on the steam side of the piston," says, on page 107, that the difference of pressure within boiler and cylinder amounts in some cases from 25 to 30 per cent., where in well protected cylinders the difference is reduced to a small fraction, and in one instance page 105, the relative pressures within the boiler and steam chest are like 98 to 101, which was caused by an incidental overheating of steam within the smoke box in steam pipes of ordinary construction; the author on making his deductions from experiments on the subject remarks:—"It has been seen how by well protected cylinders, and especially by well dried steam, this reduction of pressure may be extinguished, and the tractive power of the engine fully maintained at all speeds." This separate heating of steam in the smoke box introduces us into a new field of inquiry, as to which we shall now only say that if means can be devised for economically surcharging the steam after it leaves the boiler, converting it into what has been called "anhydrous steam," or "stame," much benefit may be anticipated from such a course.

On the figures the same letters of reference refer to like parts.

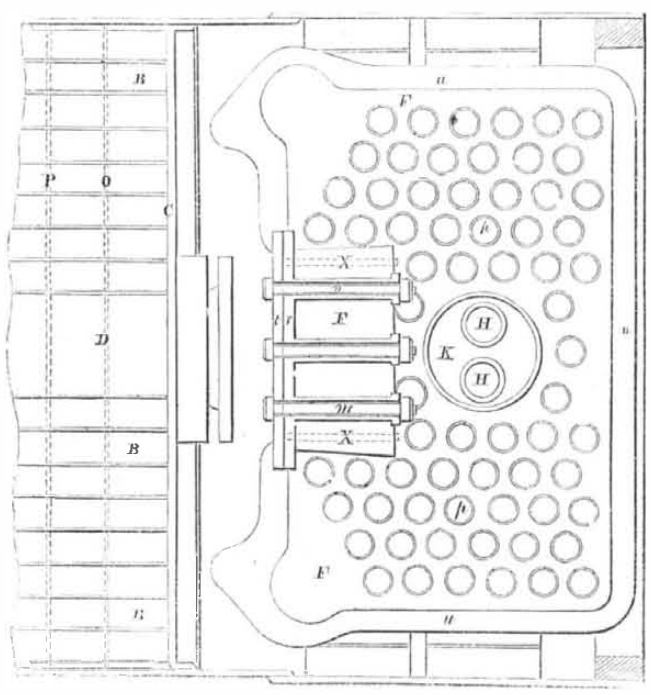
G is the smoke box attached to the cylindrical part of a locomotive boiler; B are the

Figure 1.



flues attached to the flue sheet, C; D is the steam pipe which leads the steam from the boiler into the throttle valve, E, which has as usual a cover, *s*, which is necessary for the finishing of the valve seat, and putting in of the V valve. Flanch, *t*, surrounds the regulator, E, to receive the apparatus which carries a corresponding flanch, *r*. The main body of the apparatus is of cast-iron, being provided with a flanch, *u*, to receive the sheet iron bottom, *v*, which is riveted to the flanch, *u*.—Plate *v* may be of cast-iron and in that case it is cast in one piece, with the main body of the apparatus, F, which does away with the flanges, and considerably simplifies the fitting, also giving more space for the flues, *p*. The ase so formed is from 4 to 8 inches high, according to the size of the smoke box, and is perforated with as many flues, *p*, as can be got in, in accordance with the strength of the cast-iron, there is however one larger flue, K, of copper or brass in this case about 7 inches inside diameter, which allows the exhaust pipes, H H, to discharge the steam into the chimney. This latter flue, K, in case the bottom, *v*, is cast solid with the main body of the apparatus, is likewise of cast-iron, and is cast in one piece with, F. In the latter case though the copper flues together with the main body of the apparatus may with advantage be put at an angle, it is more correct to have the centre line of the flue K, in a line with

Figure 2.



the centre line of the chimney, which arrangement may also be adopted in the case where the flue, K, is of brass or copper, when also the length of the exhaust pipes, H, may be reduced to the dotted line, T. Within the apparatus and below the throttle valve, there are two partitions, X X, equi-distant from the centre, and being cast in one piece with the main body, F, these partitions may be extended and placed at greater distances from one another; their object is to insure a better circulation of steam between the flues, or to prevent the steam from immediately passing into the steam pipes, J. Plate *q* is attached below the apparatus, which plate if looked upon from the side in contact with the apparatus, represents a surface perforated with holes exactly corresponding with the flues of the apparatus, which holes are bevelled to sharp edges on the opposite side for the purpose of easing the current of air; this plate may be cast in one with the apparatus, or be bolted to it, according to the space allowed to the latter, as in the case where the plate, *q*, interferes with the removal of the upper row of boiler flues, it ought to permit of an easy removal. In case that the throttle valve is inside the boiler, the apparatus is bolted directly to the flue sheet. Though this construction of an aparatus is considered by the inventors to be the most simple and easy for repair, they are aware that the perforations may assume many different shapes and still answer as far as the heating of steam is concerned. The part of the apparatus subjected to the current of air may also be composed of a row or rows of wrought iron or copper tubes, their ends terminating into three chambers of which the first around the throttle valve is designed to distribute the steam and the two others, one on each side of the smoke base, to deliver the heated steam into the steam pipes communicating with the cylinders; it will be found that where the throttle valve is within the smoke box, the space allowed for this latter arrangement is too narrow and even where the throttle valve is in the boiler, the arrangement forms a greater obstruction to the draft, has less heating surface, and is inferior to the one represented in the engravings. There is a third arrangement which may be thus understood; by introducing a second flue sheet, dotted lines P, say 4 to 8 inches from the end of the boiler near the smoke box, a partition will be formed which excludes the water, if then an iron sheet (dotted lines, *o*,) is suspended in the centre between the flue sheets, fitting tight to the cylindrical part of the boiler, steam being introduced, it will be made to circulate around the flues before entering the throttle valve, but this would probably impose a duty upon the flues, without which they would be found more durable. This arrangement may also be attached as a separate apparatus in front of the boiler, but it would meet with the aversion of the engineer from the fact that it would prevent an easy access to the main flues or in other words would require the removal of the apparatus as often as a leakage of the main flues would require these to be repaired.

There are two principal conditions which have to be complied with to insure success to the contrivance. 1. Can the apparatus be easily removed or attached? The flanches, *t* and *r*, are at sufficient distance from the flue sheet to allow of easy access to the lower bolts which connect the apparatus with the throttle valve, this, however, is not the case with the upper bolts, it will therefore be found that the bolts, *n n n*, extend the whole length of the regulator, resting in recesses open at the top; the nuts of these bolts are below the chimney, and the engineer by introducing his arm through the large flue, K, will find no difficulty in tightening these bolts; the lower part of the apparatus fully clears the boiler flues, and is merely the plate, *q*, in case it extends much below the apparatus near the end of the smoke box which requires to be replaced. 2. Does it spoil or improve the draft? Assuming the space above the apparatus to form a part of the chimney, every exhaust from the cylinders will, as usual, form a certain vacuum below the smoke pipe, and immediately generate a current of air through the flues, *p*, the air projected towards the oblique angle of the smoke box, will be thrown towards the centre of the apparatus above the large flue, K, ready to be thrown out by the following exhaust, the short intervals between the exhaust cannot destroy the action of this principle. Through the better condition of the exhausted steam the vacuum will be considerably improved without counter pressure on the piston.

Measures have been taken to secure a patent. More information may be obtained by letter addressed to the inventors.

The French Courts do not allow milkmen to sell water for milk. A farmer of Corbeil who had been sending milk to Paris, or what pretended to be milk, when one-third of it was water, was recently fined a hundred francs and sentenced to a month's imprisonment.

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Scientific American

NEW-YORK, MARCH 26, 1853.

Money Paid by Government for Inventions.

Within a few years Congress has appropriated a considerable sum of money for testing inventions, besides a great amount in purchasing patents. By the report before us, by Hon. W. H. Bissel, of Illinois, on the ether question, we learn that $110,000 have been appropriated to test inventions within the past ten years, but little of which has resulted in permanent success. We cannot say however, that we cavil at or blame government for making prudent and unextravagant appropriations to test reasonable and plausible inventions, nay, we admire and approve the spirit which dictates the appropriation of a reasonable sum to test any new and apparently useful invention, that would prove beneficial to our country. There is great danger, however, in making such appropriations, lest they may be granted for totally unworthy objects through crafty solicitation and an undercurrent influence. Out of nine appropriations to test inventions, six of them do not appear to have been altogether successful, at least they are not now, so far as we are informed, in use; such as $15,000 for Colt's submarine battery; $5,000 for preserving canvas; the testing of fire ships by U. Brown, $10,000; testing Crutchett's gas lights, $17,500; and $20,000 for testing Page's electro magnetic power; and $5,000 for testing inventions to prevent steam boiler explosions. The money thus expended was ostensibly for the benefit of science; but Morse's Telegraph, for which $30,000 were granted to test the line between Baltimore and Washington appears to be the only successful invention out of the nine for which an appropriation was made.

Our government has purchased quite a number of patents, and among the grants we perceive $76,300 to the heirs of Robert Fulton. We also perceive that $25,000 were granted to Messrs. R. S. McCulloch, and J. C. Booth, for the use of their patent processes for refining gold, which we believe is not used at all now, and respecting which there have been such hot words and controversy between the patentees.

Government has appropriated a great deal more than what appears in this report of the Committee on Ether; for example: $10,000 was paid for Hunter's propeller wheel, for one of our ships in the navy, and it turned out a complete failure. We suppose that others have received like benefits for producing like results. Uncle Sam is looked upon by many as a fine old gentleman, with exceedingly deep, wide, and altogether too heavy pockets, for the benefit of his health to carry. We sympathize with an inventor of moderate means who has an apparently good and useful invention, but which requires an amount of capital far beyond his ability to test fairly; in such a case we commend the inventor who has faith in his project, in soliciting Congress to test it fairly, and demonstrate its usefulness and benefit to man. But we are opposed to Congress voting money either to purchase an untried patent, or testing the merits of any new invention when the owners of the one or the author of the other has capital at his command, and abundant ability to introduce it into public use.

The Ericsson back to New York.

The Ericsson, or Hot Air ship is now lying at her old berth at Green Point, Williamsburgh. It will no doubt be interesting to our readers to know the present opinion of some of our papers about it, and what she is lying at that place for.

"The ship Ericsson, which arrived here on Monday, left the Capes on Friday afternoon, and stopped four or five hours on the way.—The confidence of the owners, it is said, was greatly increased in the caloric engine by the late trip. She went to Washington before she was complete in order to be there before the adjournment of Congress. She will now go to the shipyard at Williamsburgh, and remain about a month undergoing the finishing operations. The object thus far having been to see how well the machinery will work; it is supposed that the test of speed will be an object on her next appearance. It is claimed by some of the admirers of the new motive power, that when the maximum of speed is reached in the caloric engine, the steamers will not exceed them in rapidity by more than a knot an hour."—[Tribune of the 16th.

The caloric ship Ericsson, which returned to this port on Monday, is soon to leave for London, from whence it is intended to send her to Australia. Her recent trip to the South has established the partial success of the new principle, at the same time that it has suggested some important improvements, the introduction of which it is expected will materially augment her rate of speed. Her appearance in the Thames will create quite a sensation among the Britishers."—[New York Herald of the 16th.

The Herald of the 24th Feb. said, about the Ericsson, "the caloric experiment has been signally successful," it now says *partially* successful.

The "Tribune makes excuses for the bad performance of the Ericsson, by saying she went to Washington before she was complete. Her speed on her trip home, was about 4½ miles per hour. After her last trip down New York Bay, she was laid up at Green Point for a month getting some repairs made, and now after her trip to Washington she is to be laid up for another month's repairs.—These are not our reports but those of the papers who have hitherto so highly praised the Ericsson. Before the hot air ship will be able to compete with a steamship, she will have to get in new boilers and engines, use more coal, and keep a good supply of water in the boilers. Those ignorant men who have talked about her running faster if she had larger engines, would look blank if told she could not run as fast as the Arctic if she was stowed with hot air engines from top to bottom, but so it is.

What excuses are now made for the slow speed of this ship by the very papers who shouted and bayed a few weeks ago at James Watt, Robert Fulton, and all the inventors that ever lived, and all the steamboats in creation. The "Tribune" at last gives in and admits that after she has attained to her greatest speed, steamships will still run faster, does this look as if "the days of steam were numbered."

Since we last said anything on the question of hot air as a motive power, the subject was discussed two nights in the London Institute of Civil Engineers, and a paper was read on it by B. Cheaverton. Some of the most eminent men in the country, such as Stevenson, Rennie, Meadows, Sir Geo. Cayly, &c, were present. Drawings of the Ericsson's engines were presented and explained. They all condemned the regenerator as a fallacy, and the conclusion arrived at was, that with the amount of coal burned she made slower progress than a steamer would.

We have made but one or two commentary remarks; there is much that we could say, but we do not wish to take up too much room discussing one subject. We have presented a great deal of information respecting the Ericsson, because this ship has created a great sensation throughout the whole country, and our readers desire to have all the impartial information they can get about it. We will still present from time to time such information as may be new, instructive, and interesting about hot air as a motive power. We conclude by stating that the "American Journal of Science and Art" for March, after descibing the "Ericsson's" engines says, "we do not at present undertake to discuss the probable success or failure of this important enterprise," and thus the great gun fires neither a blank nor ball cartridge, the gunner evidently exhibiting either a fear or a want of ability to do so.

Railroads and their Accidents in New York.

By the Report of our State Engineer, Wm. McAlpine, C. E., of the railroads in this State, for 1852, we learn that the whole number of passengers carried over 29 railroads, was 7,440,653, and the number of miles travelled was 343,358,545. The number of passengers injured was 82; killed, 26. The number of employees injured was 89; killed, 76; making the total number injured, 265, and killed 162. The ratio of passengers killed to the number who travelled *one mile*, is one for every 13,206,098 passengers carried. By Dr. Lardner's statistics of railways, we learn that in England the accidents to passengers who travelled one mile has been as one to 65,363,736 passengers carried. The accidents on the roads in New York to passengers therefore are nearly five times more numerous than they have been in England. There is no doubt in our mind but if all our roads had double tracks we would have fewer accidents, but at the same time we are convinced that our tracks are not sufficiently guarded; they should be fenced in, and no person should be permitted to travel on them. There should be a law made to punish trespassers, but this cannot be done until the tracks are enclosed. No less than 76 persons killed by being run over, while standing or walking on the track, and only 26 by collisions. In England they are far behind us in the construction of their cars; if they would adopt our comfortable long cars there, instead of using their old fashioned *dumpy ones*, they would show some appreciation of Brother Jonathan's good sense and ideas of railway comfort. Great improvements have yet to be made in railway management, as connected with safety and comfort, after which the friends of Mr. Ray and the American Institute may modestly claim some testimonial of gratitude to those benefactors of American genius, who so promptly offered and awarded those prizes for railroad improvements.

Events of the Week.

EVAPORATING SUGAR—BESSEMER'S PROCESS—The claims of two patents for improvements in the manufacture of sugar, were published in the last number of the "Scientific American. The patentee," Henry Bessemer, has long been favorably known in London, in connection with the refining of sugar. Some enquiries having been made of us since last week, respecting the alledged improvements, we will present all the information of which we are in possession at present.

Hitherto all sugar has been boiled to expel the moisture, and leave it fit for crystallizallization. To boil sugar under a high heat completely discolors it, and previous to 1813, when Mr. Howard invented the vacuum pan to boil the sugar under a low heat, it was almost impossible to produce white sugar at all. The vacuum pan and the charcoal filter, invented in France by Mm. Derome & Cail, in 1824, produced two revolutions in the manufacture of sugar, and it is asserted by Mr. Bessemer's admirers that his new improvements will produce another revolution.

By the new process the boiling of the sugar juice is dispensed with, the water is driven off the juice by bringing it in contact with currents of dry hot air blown in upon it as stated in the claim. The hot air is made to sweep over the surface of the fluid which is taken up on revolving metal plates surrounding a hollow perforated cylinder. By this simple method it is said white syrups are concentrated without producing any discoloration at all. The air is heated for this purpose by being driven by a blower through tubes passing through an oven or furnace.—

The second patent claim is for an improved filter. Crude sugars are of an ugly dark brown color, which is due to an external coating of molasses, which surrounds the crystals of the sugar. This crude sugar in an almost fluid state, is placed in a machine and spread in a thin sheet in a circular table of wire gauze. A partial vacuum is formed underneath by an air pump, and the wire gauze table rotates under a series of fine jets of water, which pass through the sugar with great velocity. This washes off all the molasses, leaving a pure and nearly white sugar. These operations are said to be performed with extraordinary facility and in an incredibly short space of time. Sugar boiling, refining, &c., are practical arts, that is to say, any departure from old practices can only be determined as an improvement by a *fair trial*, nothing else can decide the question.—Opinions, however, based upon experience, may be given, and with respect to the drying of sugar with hot air, we think well of it, we believe that it will operate well, it rightly conducted.

MOUNTAINS IN THE SEA.—Capt. Denham, F. R. S. of the British Navy, while on a passage from Rio de Janeiro to the Cape of Good Hope took deep sea soundings of the great depth of 8½ miles. In the "London Times" it is stated that soon afterwards he sounded again in only 19 fathoms, on an extended coral bank, thus showing that there are some very high submarine mountains in the ocean, which for the practical benefit of man as a commercial being it is of more importance to know, than the height of the mountains of the moon. It shows the necessity and importance of acquiring a thorough knowledge of the configuration of the bottom of the seas and oceans. There ought to be hydrographic maps of all the seas and oceans, and all maritime nations should join in this great work. Something has already been done by our navy, but a great work is still before us. What has been done will be found by our readers in the excellent Reports of Lieut. Maury, of the National Observatory.

At the present moment the British have two vessels, the Herald and Torch, on a surveying expedition on the Pacific, and particular instructions have been given to them to obtain deep sea soundings. They have discovered two coraline banks, extending 80 miles, suddenly jumping from 200 fathoms, to no bottom at all (beyond the lead) and then to 19 fathoms. The temperature of the sea at 1,500 fathoms was 40°, where at the surface it was 90°. The temperature at the bottom, however deep the soundings, was never below 40°. The sun's rays were traced to have penetrated to 66 fathoms.

A survey was made of the coraline banks spoken of, and the *Herald* was at anchor in the middle of the ocean for a week to the utter astonishment of some ships whose tracks lay in that direction.

Tin Plate Manufacture.

The manufacture of tin plate is one of which England can truly boast, as she is the heart centre and complete monopolist of it.—She supplies the world with it, and no country uses so much as our own. There is more tin plate used in the United States than there is in England, and the consumption of it is increasing rapidly. The majority of the roofs of our new buildings are of tin, and we do not make an overstatement when we say that for one house erected ten years ago and covered with a tin roof, there are now fifty. The price of the article has greatly advanced, and so far as we know no attempt has ever been made to manufacture it in this country. If it can be done profitably, there is a wide field open for some enterprizing company, if not, the article should be admitted duty free, as it interferes with none of our manufacturing interests, and we have now a surplus revenue.

Tin plate is one of the most useful metallic products. No other metallic product is so adaptable in its nature to be made into every form for public and domestic use. At the present time, manufacturers of tin ware and whitesmiths generally, are complaining of the high price of tin-plate; if it were cheaper than it is, we are satisfied that it would be a general benefit to our people.

The Ray Premiums.

The Committee of the American Institute has reported on the Ray Premiums; date of Report March 15, 1853. Names of the Committee; Geo. Stark, M. Sloat, W. Cummings, J. R. Trimble, F. Hungerford. There were four prizes offered, two of which only have been decided upon, viz., "the railroad brake" for which the prize of 400 has been awarded to T. A. Stevens, of Burlington, Vt. The prize for a "night seat for cars," $300, has been awarded to Samuel Hickox, of Buffalo, N. Y. The prize of $1,500, for the best invention to prevent railroad collisions, the breaking of railroad axles, and the prize of $800 for the best invention to exclude dust from cars, they did not decide upon. The reasons given by the commitee are: "Doubts of their utility (the inventions exhibited) for actual service."

The excuse offered by the Committee for taking such a long time to make the report, is that the private business of the members made it very difficult to get a sufficient number of them together. And so out of the sum of $3,000, which was offered as prizes, the Institute has awarded $700. This brake was illustrated on page 132, Vol. 7, Sci. Am.

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Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING MARCH 15, 1853.

TURNING LATHES—By Warren Aldrich, of Lowell, Mass.: I claim, first, the improvement described, which consists in giving an automatic motion to the upper slide or tool rest, when set at any angle to the bed-piece of the lathe, instead of moving it by hand, so as to turn with ease and accuracy, solid or hollow cones, as set forth, by means, substantially, of the screw, revolving worm shaft, and revolving plate, as set forth.

EXPRESSING SUGAR CANE JUICE—By Henry Bessemer, of Baxter House, England. Patented in England, Feb. 24, 1852: I claim the improvement of constructing each of the cane-pressing tubes, substantially as specified, viz., with sides made parallel some distance (for the working of the piston against), and to approach one another towards the mouth of discharge of the pressed cane, whereby advantages as mentioned are gained.

Also the combination and arrangement of the compresses, or pressing tubes, and two conjoined pistons, with one revolving, actuating shaft, and its mechanism, to give to their plungers or pistons a simultaneous reciprocating rectilinear motion, all as mentioned.

HEATERS FOR SUGAR SYRUP—By Henry Bessemer, of Baxter House, England. Patented in Eng., Feb. 24, 1852: I am aware that in locomotive engines water has been heated by standing in tubes exposed to the flame or direct heat of a furnace; now such a mode of heating will not answer for the treatment of the saccharine syrup, as the heat of a furnace is not susceptible of regulation, as is that from steam, the latter not burning the syrup, or injuriously heating it, as would the former.

I have discovered that the heat of steam applied to syrups, as described, in connection with the action of gravity, produces advantages, in rapidly heating the syrup, unattainable by any process, when the syrup is passed through pipes heated by direct heat, or the flame of a furnace.

It is, therefore, that I expressly disclaim the mode of heating water, by allowing it to flow through a stand or tube, heated by the direct heat of a furnace, but base my invention of the method described of treating saccharine syrup, by means of the apparatus represented, as arranged and constructed to operate, for the purpose set forth, by the power of gravity and steam, the same consisting of a combination of the receiving vessel, series of tubes, a chamber and pipe, and the steam chamber, having induction and eduction pipes, as specified.

TOPPING-LIFT AND PEAK HALYARD BLOCK OF SAIL VESSELS—By Wm. & S. G. Coleman, of Providence, R. I: We claim supporting the topping-lift, by means of a crane, of such form and construction, that when the topping-lift sags, when the sail is hoisted, it shall not foul or chafe against the peak halyard block.

Also, so arranging and constructing such crane, that it may also support the peak halyard block, as specified.

ROCKING CHAIRS- By Peter Ten Eyck, of New York City: I claim in combination with a sitting chair, so arranged that the seat may rock upon the legs, or support the safety piece or guard, hung eccentrically to the pivot of the bar on which it rests, and the spring for preventing the top part of the chair from rocking too far or too suddenly, as described

KNITTING MACHINES—By Moses Marshall (assignor to W. Aldrich & L. B. Tyng), of Lowell, Mass.:

I claim, first, connecting the rotary depressers and the feeder, which carries the thread, with the arm which connects the reciprocating cam bores, as described.

Second, dividing the plates which support the needles and cast the stitches at the angle of intersection of the two sets of needles, so that the fabric knit, will or may pass between them

Third, forming the stitches alternately on each side of the needle rests, by two sets of needles placed at an angle to each other, and operating one needle at a time, as set forth.

RE-ISSUE.

SELF-ACTING MULES FOR SPINNIGG—By Wanton Rouse, of Taunton, Mass Patented originally Nov. 2, 1852: I claim, first, governing the revolution of the spindles in winding the yarn on the cop, also in backing off during the progressive stages of the building, by means of a cam or any equivalent device of irregular form, circumferentially with the said irregularity, varying from end to end, the said cam or equivalent being caused to operate upon the mechanism which drives the spindles, in any way that will produce the results set forth.

Second, the mechanism for causing the finger through which the irregular surface of the cam or its equivalent, acts upon the mechanism which drives the spindles, in backing off and building on, to traverse the said cam, and to be kept close to its surface, consisting of the screws, nut, cord or chain, lever, and stud, operating in combination, as set forth.

First Decision Under the New Steamboat Law.

The inspectors of steamboats at Cincinnati, appointed under the new steamboat law passed by Congress, have made a thorough investigation into all the facts touching the recent collision on the Ohio between the steamers Falls City and Pittsburg. The testimony elicited established the following facts:—The night was a foggy one when the collision occurred, and the "rules and regulations" requiring the "ringing of the bells and blowing the whistle at intervals of two minutes when running in a fog," were not complied with. Had they been complied with, the collision would not have taken place. As it was, laudable efforts were made by both boats particularly the Falls City, to prevent it.—The signal bell of the Falls City was tapped twice, signifying her wish to go to the larboard, and that of the Pittsburg tapped once, expressing a desire to go to the starboard, but unfortunately, the signal of one was not understood by the other. It was also proven that the collision would have been rendered less harmless had both boats instantly stopped on discovering each other. This was done by the Falls City, but not so promptly by the Pittsburg. In view of all the facts, they acquit the two engineers who were on duty at the time, and suspend for twenty days the license of John White, the pilot of the Pittsburg, and the license of Jeremiah Mason, the pilot of the Falls River for ten days, for not observing the rules and regulations. The inspectors state that the penalty in this case is made light from the fact that the rules are new, and as yet imperfectly understood; but that in all future cases they shall exact the most rigorous penalties of the law.

(For the Scientific American.)

Drying Meal and Lumber---Experiments with Steam Heat.

I took out a patent in March last for my machine noticed in the "Scientific American," July, 1847, and am now using the invention in connection with Hon. H. L. Ellsworth, of this place, for Kiln-drying Corn Meal and Hominy for shipment.

The primary object in view in getting up this invention, was to kiln-dry with little fuel, and use steam as a regulator of the heat, to prevent scorching. In the old mode of using steam, much heat is lost from the arch, and also by conducting the steam at some distance from the generator (as is frequently the case); it is nearly condensed by the time it reaches the point where its influence is needed. To remedy this, you will remember I pass the flues from the arch several times through the steam chamber. Some heat is also lost by the old mode, in permitting the steam to escape in order to make room for a new and hotter supply. This is also remedied by making only steam sufficient to keep the box full, and keep up the heat by the flues from the arch.

I did not, however, suppose I could heat the steam beyond about 212° with the small confinement which I used (there being always an open discharge at the bottom of the steam box for the steam to pass off when there was any pressure). But I soon found that I was actually heating the steam with only this small confinement, even to the point of ignition.

Being engaged in the lumber business, I thought the plan a good one for seasoning it, and accordingly put it at once into practice with the happiest results. I also applied the heated steam to seasoning barrel staves, by which I removed the sap from them in a few hours, and they would be fit to work with little exposure to the air, to expel the moisture occasioned by contact with the steam. The staves thus seasoned proved to be stronger, and would dress smoother than those seasoned in the open air.

Since the matter of heating steam without confinement was a disputed point, I determined to make a trial that would settle the matter. I had often set fire to wood by the steam, in making my experiments; but many were skeptical because the books were against it.

For the purpose, therefore, of making a thorough trial, I constructed a double box for the steam, and filled the spaces between them with saw-dust for a non-conductor. I then made an excavation in the ground of the size of the steam box, and of sufficient depth, into which I placed a stove (with about 40 feet of 7 inch pipe, to save heat), and then placed the steam box, without a bottom, over the excavation, and banked the dirt up to it to keep in the heat. A pan of water was placed upon the stove to make steam to fill the box, the pan being supplied with water as often as it evaporated. I then weighed 1000 feet of green white wood lumber and placed it in the box, commencing four feet above the stove and pipe, to avoid the direct heat of the arch. The lumber was stuck up with lath between, to allow the free circulation of steam and heat through it. As the heat and steam were both generated below the lumber, they rose together into it,—the extra heat to liquefy the sap, and the steam to keep the pores of the lumber open for the sap to pass out, and also to keep the lumber from scorching in case too high a heat should be raised. It was therefore expected I should make a two-fold experiment, viz., to ascertain whether I could season more rapidly than by the old method, and also to settle the matter whether I could heat the steam without pressure beyond 212°.

Those who were skeptical said, if I could kiln-dry the lumber in four days, they would be satisfied. I built a fire in the stove (placed in the vault beneath the lumber) at about 5 o'clock in the morning, and kept up what would be equivalent to a good bar-room fire in a cold day. The box was soon filled with steam, made in part, doubtless from the green lumber, and sooner than many persons would imagine (from the small amount of fuel used) the lumber was evidently hot—indicated by steam, which at times forced its way out through the box. In about 12 hours from the time of making the fire, viz., at 5 o'clock in the afternoon, I discovered smoke issuing from a point in the kiln about midway of the lumber, at a place where, at times, during the day, I had seen small quantities of steam escape. Since the lumber could burn no faster than air was admitted at that place, I partially closed the aperture and continued the fire about an hour longer—then opened the kiln, extinguished the fire (which had burned but a few feet), and removed the lumber, while hot, in order to permit its own heat to expel the moisture occasioned by the steam. When the lumber was cold I re-weighed it, and found I had diminished its weight 1200 lbs. and actually set it on fire with the steam!

On examining the lumber the skeptical gentlemen acknowledged it was well seasoned, or at least that the sap was all removed, and proceeded at once to prepare it for constructing a building.

But I do not intend to season thus rapidly, nor do I think it policy, for the benefit of the timber, to raise the steam to so high a heat, and for reasons which will appear hereafter. But that the steam was raised to the point of ignition I will proceed to give the evidence. The stove was so arranged that no sparks could issue from it into the lumber above, and the pipe was not only sound, but the joints were cemented, thus avoiding the possibility of setting fire to the lumber by means of sparks. Then add to this the improbability of a spark passing four feet through dense steam before reaching the lumber above the pipes, and then passing in a zig-zag course, through sixteen thicknesses of boards, stuck up as before-mentioned, before reaching the point where the fire commenced,—and the impossibility of the fire being kindled by the sparks will be settled.

The known fact that steam, however hot, will not ignite without being supplied with air, is also another evidence that this was done by the steam; as the fire took at a place quite distant from the arch, and at a point where a crack in the box admitted the air and discharged steam. At the same time a board, making a part of one end of the vault beneath and placed only one foot from the stove, was neither colored nor scorched by the heat, as no air was admitted at that point. I called the attention of many scientific men to the experiment, and none expressed a doubt that the lumber was set on fire by the steam.

You doubtless remember the report that was made to the Academy of Science, in Paris, a few years since, by a M. Viobelta, of some experiments which he had made in the seasoning of lumber by a high heat of steam. He placed some pieces of the different kinds of wood into a steam boiler, and then raised the heat by means of pressure to 480°. The pieces thus seasoned he afterwards submitted to the test, in connection with other like pieces, not steamed, and found their susceptibility to resist fracture had been increased by this seasoning (in the different kinds of wood), from 2-5ths to 5-9ths, besides causing them to receive a higher polish.

Lumber seasoned by steam has many advantages over that seasoned by hot air, since the steam removes the sap, which is one of the great causes of the shrinking, swelling, and warping of lumber, while the hot air dries this sap into the lumber, and causes the lumber to be brittle, liable to shrink, swell, and warp, as well as diminishing its strength and value for building purposes. Lumber can be seasoned as much in 24 hours by steam at 500° as in a common board kiln in two weeks, or in the open air in six months.

I will name some some of the advantages of the heated over the common steam in the kiln-drying of grain, flour, and meal. By my process you will remember the grain, &c., is passed back and forth through the dryer, by means of conveyers, inside of tubes; in order to successful ventilation (a point often overlooked) both ends of the grain tubes are left open, and as often as the grain is conducted 6 feet, inside of the tubes, which are surrounded by the heated steam, it is conveyed 2 feet entirely in the open air, for ventilation. By the ordinary heat of steam, it would be impossible to keep up a sufficient amount of heat in the tubes to dry rapidly and successfully, unless by greatly increasing the size and expense of the machine.

It is a great saving of fuel, since the heating of the steam is performed by the escape heat from the arch, and instead of making steam continually to supply the place of that which has given out only a few degrees of heat, and has passed out into the air, or has been condensed; the escape heat is applied, which, in a great measure, keeps the steam from condensing, and even when allowed to condense, it returns to the pan beneath, to be again raised in steam as needed, without the loss of heat. Another advantage is the susceptibility of steam to take up and hold several times its own amount of heat as latent, and thus when the flues passing through the steam chamber become overheated, it takes up the heat and holds it as latent, to be imparted to the grain tubes as needed, while, at the same time, it acts as a regulator of the heat to keep the tubes from scorching the grain, meal, &c., in its passage through them as is often done in the case of hot air.

In the heating of rooms, also, by steam, a great gain will of course result from starting the steam on its mission through the building freighted with five or six hundred degrees of heat, rather than the usual heat of 212°. The drying of paper could be greatly facilitated in the paper mills, by using this means of raising a high heat of steam, as the steam would be thus required to give out several hundred degrees of heat before it is condensed.

Green peas, corn, and beans can be rapidly dried by this process without danger of scorching or coloring, and without the trouble of changing from the oven to the air and air to the oven.

I have taken 21 lbs. of water from a barrel of meal and 15 lbs. from a barrel of flour, and the flour, when baked, made more and better bread. Corn may be kiln-dried in the ear (in the early part of the season) sufficiently to make it shell, by putting it into the lumber car, which is placed on a track running through the dryer. The lumber is stuck up on the car, and the car is then run into the dryer, by means of double doors at each end, the doors are closed, and the lumber is steamed on the car, and then passed out at the other end on a track, and another car is run into the dryer. Thus no time is lost, and the heat of the kiln is not wasted by being long kept open.

H. G. BULKLEY.

La Fayette, Ind., March, 1853.

Cotton Covering for Hot Beds.

The cotton is first stretched on the frames, and then coated with a composition consisting of three pints of best old boiled linseed oil, four ounces of white resin, and an ounce of sugar of lead; the latter being first ground with a little oil, and the oil and resin heated to make them mix. A coat of this should be applied every season just before use.

A telegraph line is now being constructed in California from Sacramento City to Mormon Island, Columbia, Placerville, Auburn, Grass Valley, and Nevada—a distance of one hundred and five miles. The posts have been planted on all but fourteen miles of the route.

Horse Stealing has become so prevalent in Northern Indiana, that there are societies of the best citizens organized in nearly all the counties to arrest and bring the rogues to punishment.

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TO CORRESPONDENTS.

W. B. B., of Pa.—Minnifie's Drawing Book, costs $3 bound, or 25 cents a number in sheets, published monthly.

J. E. T., of N. Y.—We cannot act as the medium for advertisers and applicants to correspond through—therefore we do not admit advertisements which refer to us for further information. Your advertisement we have inserted over your own name and place.

F. B. W., of England—Your subscription will expire at No. 30, present volume; you had better enclose to us a sovereign and send by mail for continuation of the paper, or you may pay our agents in London, Messrs. Avery, Bellford & Co, 16 Castle st, Holborn. We have not a copy of No. 19 left.

S. H. A., of N. Y.—You have made a complicated engine to obtain what is obtained by a steam jacket, as employed in the Cornish engines; do not trouble yourself any more with it.

P. B., of Mass.—If we understand you properly we should think your alleged improvement in wagon wheels not new. We think we have seen the same thing before, but could not tell without having a chance to examine a sketch. $4 received.

T. G. N., of N. Y.—There is no work upon boiler making of any practical value: Tredgold's work on the Steam Engine is the best, when done it will cost $50 or $75; Griffith's Naval Architect is a work of much value, price, bound $12.

W. T. S, of Boston—Nasmyth's steam hammer is the one which we suppose is most suitable for you. Merrick & Son, Philadelphia, are proprietors of the patent.

S S, of C. W.—If you put a quantity of sweet oil in your made soap; it will keep soft and cream like; the substance, which makes soap wash in hard water, is an alkali—an abundance of soda or pearl-ash; borax dissolved in water and used in soap lather makes it agreeable for shaving; it can be used in the soap in place of pearl ash The small "Ericssons" you will never see. We will comply with your request about the subscribers.

J. C. H., of N. Y.—You must give the finishing touch with fine Tripoli.

J. N. P., of Mass.—The arrangement of your engine appears to be new, but we can see no advantage in it not already gained by engines in common use. We think your views predicated upon a false basis. Experiment will determine this point more satisfactorily than opinion; the apparatus is too complicated.

J. S, of Pa.—We can see no patentable feature in your friend's method of operating the rudder of steamboats; substantially the same plan has been employed, but with what success we are unable to say.

R. E., of Ill.—We do not see how it is possible to arrange circular saws on a new mandril for sawing out wagon felloes and curvilinear work, we do not know of any thing of the dind.

T. S. J., of Ohio—About the time the California excitement broke out, we were shown a device for guiding a balloon similar to yours. We cannot say what it would do, as no trial was made with it.

C. C., of Mass.—Your device for breaking up railroad trains appears to be novel. Its advantages must be made the subject of a test, we cannot decide this question without, as the idea is crude.

W. B. D., of Mo.—The business at the Patent Office is very much behind, and is growing more so every week. We file from our office nearly as many applications every week as the Department grant Letters Patent, exclusive of the applications made from other sources. Yes, it is too bad: more Examiners should be appointed. We have had some cases before the Office four and five months.

B. B., of N. Y—Your device for cutting dovetails is not patentable: essentially the same thing has been used for the same purpose.

G. J., of Ohio—There is nothing new, useful, or patentable in your device to be used as a substitute for the crank; it is preposterous and unworthy of your attention.

J. S., of Ky.—You have lost your right to the patent, having virtually abandoned it to the public. You could contest it with Mr. M., but without hope of reward, even if successful in gaining the point of priority.

O. P. B., of Tenn —We placed $1 to your credit for advance subscription. If you have any business to transact with us please send a model.

W. R. G., of Ky.—Your method of ventilating cars is not new, the same device was shown in several models exhibited at the last Fair of the American Institute.

A. H., of Ill.—In the year 1840 a model was exhibited before the members of the New York Legislature, which embraced tha same ideas as are found in Mr. C 's engraving; this fact we have lately learned from an eye-witness. He has no patent and we believe cannot obtain one.

Money received on account of Patent Office business for the week ending Saturday, March 19 :—

E. F., of Ct, $50; R. M F., of N. Y., $25; W.W., of Conn., $30; J. B. T., of N. Y., $25; O. S. J, of Ct, $30; J. A. B., of N. Y., $25: A. S. N., of Pa., $55; J. P. A., of Ct., $25; T. H. T., of N. Y., $30; O. D. D., of N. Y., $300; P. W., of Me., $55; D. A. M., of Pa., $55; G. W. F., of Ohio, $55; P. K., of Ct, $20.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday March 19 :—

J. S., of N. Y.; J. B. T., of N. Y.; J. A. B., of N. Y.; C. D. C., of Mass.; J. C., of Ga.; N. C., of N. Y.; T. F., W., of N. Y.; T. H. T., of N. Y.; J P. A., of Ct.

ADVERTISEMENTS.

American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

MUNN & CO., Scientific American Office,
128 Fulton street, New York.

THE NEW HAVEN MANUFACTURING Company, New Haven, Conn., having purchased the entire right of E. Harrison's Flour and Grain Mill, for the United States and Territories, for the term of five years, are now prepared to furnish said mills at short notice. These mills are unequalled by any other mill in use, and will grind from 20 to 30 bushels per hour of fine meal, and will run 24 hours per day, without heating, as the mills are self-cooling. They weigh from 1400 to 1500 lbs., of the best French burr stone, 30 inches in diameter: snugly packed in a cast-iron frame, price of mill $200, packing $5. Terms cash Further particulars can be had by addressing as above, post-paid. 28tf

THE NEW HAVEN MANUFACTURING CO. No. 2 Howard st, New Haven, Ct., are now finishing 6 large Lathes, for turning driving wheels, and all kinds of large work; these lathes weigh 9 tons, and swing 7 1-3 feet, shears about 10 feet long. Cuts and further particulars can be had by addressing as above, post-paid. 28tf.

PARKER'S PATENT METHOD OF BANDING Pulleys.—Portable Sawing Machines, made separate either for circular or scroll sawing, may be seen at No 110 East 13th street, near Third avenue, where any information will be given as to its application to other machinery. 28 2*

PORTABLE STEAM ENGINE—Any one having for salo a good second-hand Portable Steam Engine and Boiler, of from 3 to 7 horse-power, will do well to address. C. H. WARNER,
28 2* Macon, Ga

TO SASH OR CABINET MAKERS ABOUT to commence business.—A couple of young men acquainted with working sash or cabinet machinery possessing a small capital can hear of a good chance for business in a large and flourishing city, where there is no competition, and prices from 50 to 100 per cent higher than in New York or Boston. Address J. E. TURNBULL, Saint Johns, New Brunswick. 28 4*

BOSTON BELTING COMPANY—No. 37 Milk street, Boston, Manufacturers of Machine Belting, Steam Packing, Engine and Conducting Hose, and all other articles of Vulcanized India Rubber, used for mechanical and manufacturing purposes. 28tf

E. OLIVER'S WIRE WORKS—No. 25 Fulton st, corner of Water. Locomotive Spark Wire, Patent Self-Setting Revolving Rat Traps; a new invented enclosed Coal and Ash Separator, and Wove Wire of every description. 28 4*

IRON FOUNDERS MATERIALS—viz.: Scotch and American Pig Iron, of favorite brands; Scotch patent Fire Bricks—square, arch, and circular. Fire Clay and Fire Sand; Moulding Sand for Iron and Brass Founders; Core Sand and Flour. Pulverized Black Lead, Soapstone, Sea Coal, Anthracite, and Charcoal Bolted Facings of approved quality, for sale by G. O ROBERTSON, & CO., office 135 Water street, (corner of Pine), N. Y. 19 6eow*

PORTABLE STEAM ENGINES—The subscriber is now prepared to supply excellent Portable Engines, with Boilers, Pumps, Heaters, etc, all complete, and very compact, say 1, 2, 2 1-2, 3, 4, 6, 8, and 10 horse-power, suitable for printers, carpenters, farmers, planters, &c, they can be used with wood, bituminous, or hard coal; a 2 1-2 horse engine can be seen in store, it occupies a space 5 feet by 3 feet, weighs 1500 lbs., price $240; other sizes in proportion. S. C. HILLS,
27eotf Machinery Agent, 12 Platt st, N. Y.

FOR SALE—A new Horizontal Steam Engine, complete, with pumps 7 inch bore, 2 feet stroke, well suited for a saw mil; price $25; also one second-hand, nearly new, perpendicular, in iron frame work, complete, with pump and governor, 4 horse power, price, $175: all warranted to work well and of sound materials. Address C. SIMON, Louisville, Ky., (Main between 11th and 12th sts) 27 2*

NORCROSS ROTARY PLANING MACHINE,—Decided by the Circuit Court not to infringe the Woodworth Machine—I now offer my Planing Machines at a low price; they are not surpassed by any machines as to amount or quality of work. Tongueing and grooving machines also for sale, doing one or both edges as desired; 80 machines now in operation. Address me at Lowell, Mass.,
27 10* N. G. NORCROSS.

BLACK LEAD CRUCIBLES—The subscriber is now manufacturing and keeps on hand an assortment of the above crucibles for steel melting, brass and other metal workers, which are warranted equal to any now in use. Orders respectfully solicited by DANIEL ADEE, Agent, 107 Fulton street, N. Y. 27 4*

GEAR CUTTING—To order, executed with dispatch, straight, spiral, and bevel, at the machine shop No. 60 Vesey st, N. Y. G. W. WIGHT. 27 4*

8 HORSE STEAM ENGINE FOR SALE—We offer for sale an Engine and Boiler, as follows 8 horse, horizontal, cylinder 7 inches bore, 16 inch stroke, on a cast-iron bed, fly wheel, driving pulley, governor, pump, pipes, etc.; has never been used. The Boiler has been used by the maker about one year. It is cylinder, horizontal, 16 feet long, 30 inch diameter, has a steam chamber, try-cocks, check and safety valves: price, $600. Address
MUNN & CO.

THE PROPRIETORS OF JAMES RENTON'S Patent, for the manufacturing of wrought-iron direct from the ore, are desirous of introducing the invention generally, and invite parties who may wish to negociate for rights for States and counties, or for furnaces, to make immediate application, and to visit the works at Newark and examine for themselves; they are disposed to make liberal arrangements with responsible parties who make an early application. Applicants for rights in the State of New Jersey may address Hon. J. M. Quinby, President of the American Iron Co. Inquiries or application for other States may be made to the subscribers. The furnace which is now in operation at the American Iron Co's works, corner of Parker and Passaic sts., Newark, N. J., is attracting considerable interest. Gentlemen from all parts of the county have visited the works, examined the operation, and express the highest commendation of it. JAMES RENTON, A. H. BROWN, Proprietors, Newark, N. J. 26 5*

BRIDGEWATER PAINT MANUFACTURING COMPANY DEPOT, 125 Pearl and 78 Beaver streets, New York, have on hand a large supply of this paint, and are prepared to receive orders for dry packages of 200 lbs. and upwards, and in oil of assorted colors in kegs of 25, 50, and 100 lbs. For wood, iron, stone, and brick work, it has no equal. Painters are using it with great success on brick buildings (the natural color resembling brown stone), on tin, canvas, or shingle roofs, villas, barns, fences, depot buildings, railroad cars, bridges, &c.; also for decks and bottoms of vessels. The black has been found superior to any other, for hulls of vessels, being more durable, possessing a greater body and cheaper. From its spark and cinder-proof qualities, it is well adapted to all kinds of wood work, where there is danger from fire. Testimonials of its virtues, and specimens on wood, tin, canvas, &c., may be seen at the depot. Letters must be addressed to
25 4* R. BOGERT, General Agent.

TO ARTISTS, DESIGNERS, &c., one hundred dollars premium.—The government of the Massachusetts Charitable Mechanic Association having determined to procure a new diploma to be used at the Exhibition the present year, hereby offer a premium of one hundred dollars for the best original design of one Artists and others who may be disposed to compete, will please send their drawings to the secretary on or before Saturday the thirtieth day of April next. Each drawing must have some mark upon it, and must be accompanied by a sealed envelope, bearing a similar mark, and containing the address of the party sending it. For the design which shall be adopted by the executive committee the above premium will be paid The other designs will be returned to their respective owners on demand. Any further information may be obtained by application to the Secretary. In behalf of the Government, FRED. H. STIMPSON, Secretary.
Boston, Feb. 23, 1853. 26 3*

MAXWELL IRON WORKS, 259 Bowery, N. Y. Steam engines, lathes, drilling and planing machines, machinists' tools of every description, printing, lithographic and copperplate presses, bookbinders' cutting and embossing presses, rolling machines and squaring shears, iron backing presses, improved standing press, proof and transfer presses, cylinder newspaper press, self-inking apparatus, and every article in the press line, necessary in a priniing office or bindery, made to order, on reasonable terms. All kinds of repairing done with the greatest despatch. N. B —Steam fire pumps made 10 per cent. cheaper than at any other establishment. 26 4*

PALMER'S PATENT LEG—Manufactured by Palmer & Co., at 5 Burt's Block, Springfield, Mass., for New England and New York State, and 376 Chestnut street, Philadelphia; in every instance of competition in the Fairs of the various Institutes of this country, has received the highest awards as "the best" in mechanism, usefulness, and economy. At the "World's Fair," London, 1851, in competition with thirty other varieties of artificial legs (by the best artists in London and Paris), it received the Prize Medal as the best.
25 20* (16e3w)

LEE & LEAVITT—Manufacturers of every description of Cast Steel Saws, No. 53 Water street, between Walnut and Vine, Cincinnati O. 27 6m*

SPILLARD AND DODGE—Arch Street Hall Brass Foundry, and manufactory of plumbers' brass; water, steam, and gas cock constantly for sale upon reasonable terms; 213 Arch street, Philadelphia, Pa. 25 8*

AARON KILBORN, No. 4 Howard st, New Haven, Conn., manufacturer of Steam Engines, Boilers, &c. Noiseless fan blowers and machinery in general 25 10*

NEW PATENT RIGHT FOR SALE—State rights to make and sell the premium machine for Paring, Coring, and Quartering Apples, &c.; patented on the 25th Jan'y, 1853, and illustrated in No. 23, present volume Scientific American, can be had at reasonable prices by applying, post-paid, to the sole proprietors. SMITH & FENWICK,
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20 12* EDWARD HARRISON.

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15tf

W. P. N. FITZGERALD, Counsellor at Law has recently resigned the office of principal Examiner of Patents, which he has held for many years, and is ready to assist, professionally, in the preparation and trial of patent causes before the U. S. Courts in any of the States, and before the Supreme Court of the United States. He also acts as Counsel in cases before the Patent Office, and on appeals therefrom, but does not prepare applications for Patents Office corner of E and 8th sts., Washington, D. C. 18 tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Mortising and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 27tf

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This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post paid) MUNN & CO.
At this Office.

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PATENT LAWS OF THE UNITED STATES, and information to inventors and patentees; for sale at the Scientific American office. Price 12 1-2 cents.

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SCIENTIFIC MUSEUM.

A Ship Canal to Albany.

It seems that a Committee, consisting of W. E. Bleecker and Lansing Pruyn, were appointed by the City of Albany, to inquire into the expediency of constructing a Ship Canal from Albany to New Baltimore, a village 14 miles below the Capital of the Empire State. Between these two places, during the dry months of summer, steamboats, sloops, &c., often get aground, and at no time can ships get up past what is called the "Overslaugh," or mud banks. There are many shifting sand and mud banks between the two places, so that the channel not unfrequently changes during heavy freshets, when the ice is breaking up. A letter has been addressed to the Committee named, by Mr. McAlpine, our able State Engineer, who states that his public duties have prevented him from giving the subject a complete personal investigation, but says that the duty was performed by Messrs. O. Blanc, J. D. Coleman, and W. A. Perkins, who have made the necessary surveys, maps, &c. and have proposed the route of the canal. The report is favorable for a canal elevated above the reach of freshets, to be 12 miles long, 20 feet deep, 120 feet wide at top and 50 at the bottom, and to have locks at Albany, to pass vessels 215 feet long and 30 feet wide, and locks, at New Baltimore, to pass boats 300 feet long and 80 wide.

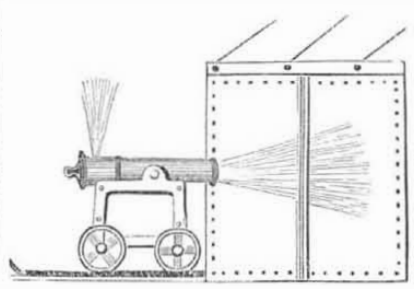
In connection with this project, provision has been made in the plans and estimates for a large basin, covering 255 acres of land, and nearly one mile in length. The estimated cost of the canal, basin, locks, and works complete, according to this report, is $2,450,000.

The object proposed to be accomplished by the work in question, is to afford an uninterrupted navigation to the city of Albany for such classes of vessels as are required to navigate the ocean, and thus permit the transfer of freight received by the canal to be made at Albany instead of New York.

Instead of making this Ship Canal, Mellen Battel, of Albany, proposes making the Hudson River navigable for ships, by building two strong walls parallel with each other, at such a distance from the shores as to contract the current of the river to 1,056 feet. Or, to copy his own description, his plan is to commence at the end of the present dock at the south end of the city, and opposite, at Greenbush, a pier on each side of the river, at least 15 feet above low-water mark, contracting the river to 1,056 feet, and carrying it down with one width as straight as possible, cutting off all intersecting branches and islands; and where it crosses branches or runs in deep water, sinking cribs of timber, filled with stone, to low-water mark; then commence a rough stone wall 8 feet wide at bottom and 4 feet at top, and at least 15 feet high, covering the top with stone the whole width—where it runs on the islands or near the shore, driving piles and laying down cap timbers and cross-ties at low-water mark; and then commencing a stone wall. Where there is a landing, says he, and a lower dock is desirable, I would build a bulk-head extending to the high ground, to prevent the current from passing back of the wall. Where I passed the branches or into deep water, I would leave gateways, so that if it were necessary to excavate to get 15 or 20 feet of water, I would pass through these gates to dump the earth or stone behind the wall.

The cost he estimates at $1,000,000: his plan strikes us as by far the best and most reasonable. A ship canal on the Hudson, for 14 miles, to get over sand banks, &c, is something strange, indeed, especially as it is considered that it will require $285,000 per annum to pay the interest on the money invested in the canal, furnishing a supply of water and tending the locks. Mr. Battel's plan is quite practicable, only the dredging machine must always be kept in operation. If the City of Albany would keep two good dredge boats going all the navigable season, they would keep the river channel, always open. Nature has given to Albany a river, which, at the driest period of the year contains as much water as would float a seventy-four gun-ship to her wharfs (if the river were well managed),—let not the people despise the gift by constructing a canal. A canal to New Baltimore, in our opinion, would be a march backward in engineering. Next week we shall publish some statements and facts respecting the improvement of the river Clyde, which, sixty years ago, contained two feet of water twenty miles below where the Arabia—a ship of 2,300 tons—got in her engines, and where ships of 1800 tons burthen now pass daily.

Artillery Ore Crusher.



The annexed engraving represents a new plan of crushing ore by gunpowder, invented by Capt. Shrapnell, London, and recently patented in England. It has been illustrated and described in the "London Mechanics' Magazine," from which we have derived our information respecting it.

The invention consists of a chamber about 10 feet long, 8 feet high, and 6 feet wide, the back of which is made of inch and a half wrought iron, and the sides of sheet iron.—The sides are rivetted and strengthened with ribs. The whole rests upon a bed of timber strongly framed. A short railroad track is placed in front of the box for the cannon to run upon. The gun is charged with powder and a wad rammed down upon it, and all above the wad is charged with broken pieces of ore, and the whole covered with another wad. It is now moved forward on the rails, against the front of the chamber, in which there is a circular hole rather larger than the muzzle of the gun. The muzzle is just introduced within the thickness of the plate, the piece is primed and fired, when the charge is projected against the strong thick plate forming the back of the box. To relieve the sides of the box from the concussive force, the roof is formed in doors upon hinges, which suddenly fly up when the explosion takes place, and act as safety valves, after which they immediately fall. The reduced ore is acted upon by a gentle blast which sends off the lighter particles and allows the heavier metallic to fall. A perforated false bottom allows the reduced ore to fall down into a drawer, which is withdrawn with the dust, to submit the latter to the winnowing process.

The method of reducing ore by powder is certainly a novel one, and naturally enough it comes from a man whose business lies in the shooting line. The "London Mechanics' Magazine" asserts that masses of California quartz, and the hardest granite were reduced to powder at one charge, in presence of the editor. We introduce this invention to the consideration of our quartz companies in California. Along with the process for making gun cotton described in the Scientific American of last week, we suppose that our gold miners may consider themselves in a fair way of reducing all the rocks of California into powder. Every invention of this kind should receive a *fair trial*, as the economy of any machine or invention is determined by experience alone. Although quartz may be thus reduced to powder, it strikes us that the mode of separating the earthy and metallic dust, by winnowing will not be easily accomplished. If we had the opportunity of a personal inspection of the operations, we would be able to give a candid and decided opinion; in the meantime the invention is illustrated and described, so that our readers may know what it is, as no small amount of curiosity has been excited respecting it, by the numerous paragraphs which have appeared in various periodicals, some of which have described its action very accurately while others have not.

The English Government have come to the decision that the public interests would be best consulted by allowing chicory to be sold in a state of mixture with coffee, provided it was so described in labels attached thereto.

The Heliochromy.

The following is a Report made by Senator James, of Rhode Island, in the Senate, on the 3rd inst., and which has been published in the "National Intelligencer:"—

"The Committee on Patents and the Patent Office, to whom was referred the memorial of Levi L. Hill, in reference to his alleged discovery in Heliochrome, or sun-painting, as denominated by Mr. Hill, ask leave to submit the following report:

Mr. Hill, having been before the committee, explained to them the history and principles of his invention, and submitted to their inspection numerous specimens of the productions of his art or invention. The committee have formed the opinion that those specimens afforded sufficient proofs that the inventor has solved the problem of photographic coloration. The committee had in their hands the plates, unprotected by glass or any other covering, and saw them freely rubbed and otherwise tested, confirming in their minds the fact of the invention and the durability of the pictures. It is believed that most of the philosophers, both in Europe and America, long since gave up, as hopeless, the search after this branch of science, which has now been discovered by one of our citizens, in one of the wild valleys of the Catskill mountains, far removed from the schools of art. The committee learn that Mr. Hill has arrived at this discovery, by which the works of nature may be copied in their original hues, through three years of persevering toil. The committee is informed by Mr. Hill that his discovery has not yet been perfected in its practical details, which is not surprising, it being but little more than two years since he obtained his first result. But the beauty of the results to which the process has already attained would seem to afford evidence that it will be perfected at no very distant day.

The prospective utility and importance of this invention are very apparent in its application to portraits, landscapes, botany, morbid anatomy, mineralogy, conchology, aboriginal history, the reproduction of valuable paintings, and to various ornamental purposes. The committee are satisfied of Mr. Hill's claim to originality and priority of invention, and deem it but just and right that he should be suitably protected and encouraged; and they deem it more particularly so, seeing that a rival claim has been set up in France since the announcement of his discovery was made. The means by which this process is carried out being strictly chemical, it would seem that the existing patent laws would not afford to the inventor the security required. Owing, however, to the short period remaining of the present session of Congress, and the press of business, the committee have been unable to devise any better or more efficient mode by which to recognise the claim of Mr. Hill, than by recommending that his memorial, together with this report, be placed on the records of the Senate."

[We would respectfully state that the Senate had better take charge of the Patent Office at once, make all the examinations and grant all the patents. If it does so in one case, out of the proper and just order of business, why not in every case? The claims of one inventor are just as sacred as those of another. Mr. Hill's course has certainly been a singular one; he has never revealed how he colored his daguerreotypes, but merely shows his pictures, and hence his claims are recognized, and the Committee reports that he should be suitably protected. Let him take out a patent, then, in the usual way. The coloring of daguerreotypes, is now public property, and would be so decided by law; the art was discovered in France and given to the world, so far as it is perfected. Mr. Hill is apparently afraid of this, hence his singular mode of procedure. What his claims are we do not know. The U. S. Supreme Court has decided that an art is not patentable; whatever new means he has adopted—his chemical, &c.—are patentable, and no more. Mr. James has made one mistake—France has set up no rival claim to that of Mr. Hill—none. M. Niepce, the favorite nephew of the discoverer of Daguerreotyping, has colored some pictures and given the result of his experiments to the world, which have been published in our columns, and from said descriptions an American in Ohio, Mr. Campbell, has tested the same and produced some striking results, which have also been given to the world through our columns, along with some of his own improvements. Does Mr. Hill employ any of the processes described in our columns? If so, let us know it; if not, he is entitled to what is his own, and no more.

Crystal Palace in England.

Great and rapid progress is making towards the completion of the new Crystal Palace at Sydenham, England. It cannot, however, be opened until the 16th or 20th of May next, instead of the 1st, as promised. When completed, this building will, notwithstanding the magnificence of its great predecessor, be the most splendid building of its kind the world ever saw. In size it dwarfs the greatest cathedrals. It will be approached by an avenue and staircase ninety-six feet broad, and will be entered through an archway two hundred feet in height, from the summit of which will be seen a vast and splendid natural panorama—the winding "silvery Thames," and the gigantic city of London appearing as only a portion of it beneath the lofty roof. Palms, the tallest and of the most stately dimensions, will rear their graceful head unobstructedly. There will, in the extensive and amply wooded ground, be many fountains of large proportions, some, two hundred feet across, will be in full play. One capacious basin, extending two thousand feet, will contain one thousand and one jets, accommodating two pyramidal fountains, with more than ninety jets each, throwing the water two hundred feet high. One half the building will be devoted to the new world and one half to the old. A conservatory, to contain the rarest and most beautiful exotics produced in the world, is in rapid progress. Statues, most perfect as works of art, and all the tributes of art and science, will adorn the building. The experiences of the past will be applied to the future, and a structure will be presented to the gaze, of the most fascinating, magnificent, and imposing character, which description is wholly unable to reproduce.

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